

been amended in response to the Examiner's requirement.

Claims 9, 6 and 8 have been rejected under 35 USC 102(b) as anticipated by Piloto et al.

Piloto et al disclose a waveguide filter made from a plurality of stacked high dielectric constant layers having vias therein and of a size so as to resonate at a predetermined frequency. The vias are filled with a conductive material, the top and bottom stack surfaces are plated with a conductive material, and the stack is fired. Thus the layers of Piloto et al are not adhered to a metal support substrate.

That means that shrinkage of the dielectric layers occurs in all x, y and z dimensions. This makes it very difficult to predetermine the size of the fired stack without tweaking and trimming the stack after firing. Piloto et al must do this by trial and error because their process is inherently non-controllable. Thus, as stated in col 4 lines 39-40, and again in col 4 lines 63-66 of the reference, after firing, the LTCC structure must be cut to the desired final external dimensions. As explained in col 5 lines 5 et seq, alternatively the lengths and widths of the unfired tapes can be cut larger than required by the length or width of the anticipated shrinkage, which is

"about" 12%. Since the shrinkage can change depending upon the composition of the green tapes, the temperature and time of firing and the like, the anticipated shrinkage for each batch of material at the temperature chosen for firing must be checked in advance, and the proper calculations for shrinkage determined.

The dielectric stack of applicants, on the other hand, because the stack is adhered to a metal support substrate, shrink only in the z (thickness) dimension. Thus even after firing, the stack retains its x and y dimensions, and the positions of vias, other components and the like. Thus applicants have a much more controllable process. There is no need for a trial and error method of cutting the fired dielectric stack to obtain correct dimensions and desired performance.

Further, applicants can align and couple their filters to different components, such as circuitry or chip attachments in a controllable way, without trimming or other mechanical means of alignment of the filters to other components, because their filters do not shrink in the x and y dimensions at all.

Thus the filters of Piloto et al do not anticipate the presently claimed waveguide resonators in that they do not include a metal support substrate adhered to the green tape

stack.

Claim 10 has been rejected under 35 USC 103(a) as unpatentable over Piloto et al.

Claim 10 requires that the metal support substrate be a copper clad molybdenum substrate. The inadequacies of Piloto et al, in that the reference does not disclose any adhered metal support substrate at all, have been discussed above. Thus applicants submit claim 10 is not rendered obvious by Piloto et al.

Claim 7, directed to inserted E-plane probes in openings of the second green tape stack connected to microstrip transmission lines on the surface of the second green tape stack, has been rejected as unpatentable over Piloto et al in view of Kubota et al. The inadequacies of Piloto et al have been discussed above. Because of the shrinkage problem of Piloto et al, alignment of transmission lines to E-plane probes in openings in the green tape would be difficult at best, if possible at all.

The Examiner contends that a plated conductive layer would function the same way as applicants' metal support layer. This is not correct. While the conductive layer after firing may give some additional support, the purpose and effect of applicants'

adhered support is to prevent shrinkage of the green tapes during firing; thus the green tape stacks of the references shrink in all directions - x, y and z - whereas the green tape stacks of applicants shrink only in the thickness, or z direction. Thus no cutting after firing is required, and the fired green tapes of applicants are readily aligned with other components.

Kubota et al do describe a ground plate, but it is not flat, it has openings therein, and there is a space between the ground plate and the overlying ceramic. Such a ground plate would not prevent shrinkage of the overlying dielectric tapes during firing as does the adhered metal support plate of applicants. Further, applicants note that claim 9 requires not only a support substrate, but adhesion between the support substrate and the green tape stack, which is what eliminates the shrinkage problem of Piloto et al.

In view of the above amendments and discussion, applicants submit the present claims are patentable over the references. Accordingly, entry of the above amendments as required by the Examiner, and allowance of the claims are respectfully solicited.

If the Examiner believes a telephone interview would advance the prosecution of this application, he/she is invited to contact

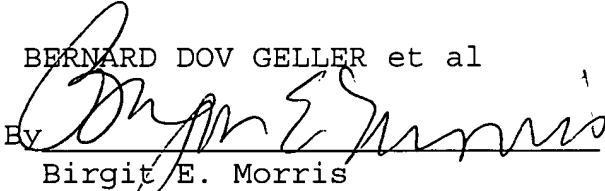
the undersigned.

A clean copy of the claims as amended herein is attached. An extension of the term for response is also attached.

Respectfully submitted,

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